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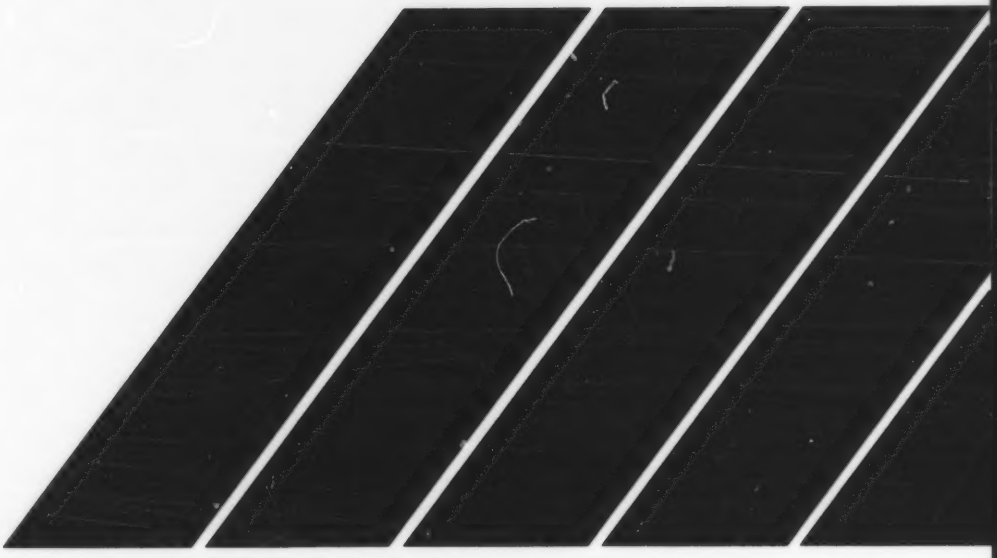
Canada Centre for Mineral and Energy Technology

Centre canadien de la technologie des minéraux et de l'énergie

Efficiency and Alternative Energy Technology Branch

Direction de la technologie de l'efficacité énergétique et des énergies de remplacement

SIXTH ANNUAL GREAT CANADIAN SOLAR RACE: FINAL REPORT



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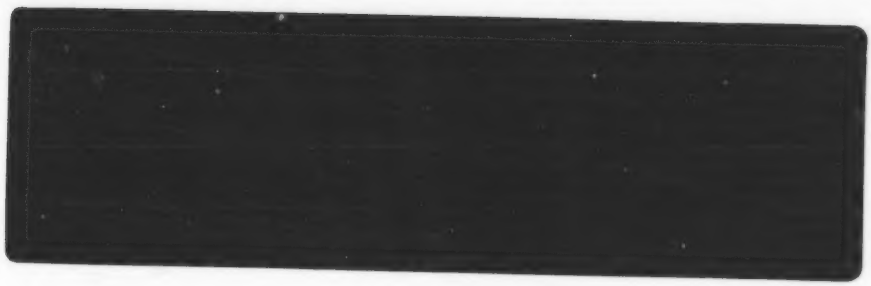

SIXTH ANNUAL GREAT CANADIAN SOLAR RACE: FINAL REPORT

PREPARED FOR:

Efficiency and Alternative Energy Technology Branch
Energy, Mines and Resources Canada
Ottawa, Ont.
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August, 1990

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Executive Summary

Since 1985, the Solar Energy Society of Canada has sponsored a series of events collectively known as the Great Canadian Solar Race (GCSR) to promote renewable energy technologies to Canadians. GCSR events help secondary and post-secondary students develop an appreciation for solar energy technologies by challenging them to design solar systems for assigned applications in a fun and cooperative manner.

For the first time, the 1990 GCSR events took place in two cities, Ottawa and Toronto. SESCI suggests that the race be further expanded to other Canadian cities. SESCI, which has several chapters across the country, is well positioned to replicate GCSR events across Canada. In fact, based on the positive public response to the 1990 GCSR events, SESCI Manitoba has indicated interest in organizing 1991 GCSR events.

At the high school level, the Photovoltaic (PV) Design Challenge, in which students design a PV-powered device, was a great success. In addition, a junior team entered the PV Hot Dog Cooking Contest, demonstrating that junior students are indeed capable of competing in GCSR events. Therefore, SESCI recommends that the high school events be opened to junior students.

For the same reasons, SESCI recommends that the PV Car Race be opened to high school students. However, it is important to note that the cost of materials may be a drawback to high school participation.

The PV Car Race continues to fascinate the public and attract media attention. Since SESCI cannot compete with large races like the GMSunrayce, SESCI believes its niche is to help encourage as many teams as possible (including high school teams) to develop cars. With an eye to future international races or a racing circuit, SESCI met with U.S. PV car race enthusiasts at the ASES conference in Texas to coordinate race rules. To maximize public awareness, SESCI proposes holding the 1991 race at an existing track (ie. Mosport).

For the past six years, the University Thermosyphon Event has focussed on heating. SESCI feels that universities may be getting tired of this concept. To revitalize the event we recommend changing its focus to cooling. Alternatively, it could be replaced with a PV pumping event. SESCI recommends that universities and colleges be polled to determine the level of interest in each event.

Résumé de direction

Depuis 1985, la Societé d'énergie solaire du Canada incorporée a commandité une série d'activités diverses, regroupées sous l'appellation de la Grande compétition solaire canadienne (GCSC), dans le but de promouvoir la technologie des énergies renouvelables auprès des Canadiens. Ce genre d'activités présente aux étudiants des niveaux secondaires et universitaires le défi de concevoir, dans un contexte amusant et coopératif, des systèmes solaires devant servir à des tâches précises, tout en leur donnant l'occasion de se familiariser avec la technologie solaire.

Pour la première fois cette année, les activités de la Grande compétition ont eu lieu dans deux villes - Ottawa et Toronto. La Société d'énergie solaire du Canada incorporée (SESCI) propose que cette compétition ait lieu également dans d'autres villes canadiennes. La société possède des ramifications dans d'autres villes ce qui lui permettrait de reproduire cet événement un peu partout au pays. De plus, devant l'intérêt manifeste du public pour ce genre d'événement, la SESCI du Manitoba s'est dite prête à organiser des activités de promotion de la technologie solaire.

Au niveau de l'école secondaire, le nouveau "Défi de conception dans le domaine photovoltaïque", pour lequel les étudiants devaient concevoir un appareil photovoltaïque, a obtenu un grand succès. En outre, une équipe junior a participé au Concours du "Chien chaud cuit à l'énergie solaire", démontrant ainsi que les étudiants de cet âge sont tout à fait capables de participer. SESCI recommande donc que ce groupe d'âge soit également visé.

Pour ces raisons, la société recommande que la course de voitures propulsées à l'aide de cellules photovoltaïques s'adresse également aux étudiants du secondaire. Il est bon de noter, cependant, que le coût du matériel, dans ce cas, pourrait a'avérer prohibitif.

Les courses de voitures photovoltaïques continuent d'attirer l'attention du public et des médias. Compte tenu que la SESCI ne peut faire concurrence dans le domaine de courses plus importantes comme celles qui sont organisées par GMSunrayce, la société croit avoir trouver sa vocation en aidant autant d'équipes que possible (y compris les équipes des écoles secondaires) à développer des automobiles. Dans le contexte de courses internationales à venir ou d'un circuit de course, SESCI a rencontré les adeptes de la course automobile photovoltaïque américaine dans le but d'établir les règlements pour ce genre de course lors de la conférence de la ASES au Texas. Afin de

favoriser une plus grande prise de conscience collective, SESCI se propose d'organiser, en 1991, une course sur un circuit déjà existant (p. ex. : Mosport).

Depuis six ans, les activités au niveau universitaire visant à illustrer le principe du thermsiphon portaient principalement sur le chauffage. SESCI est d'avis que les universités seraient favorables au changement. Afin de donner un regain de vie à cette activité, nous recommandons maintenant que cette activite porte sur les refroidissement. Cette activité pourrait également être remplacée par une activité de pompage alimenté au solaire. SESCI recommande que soit mené, auprès des universités et des collèges, un sondage dans le but de déterminer l'interêt que pourrait présenter une telle activité.

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	33

232 Walford Rd.,
Sudbury, Ont.
P3E 2G9
May 22/90

SESCI,
3 - 15 York St.,
Ottawa, Ont.
K1N 5S7

Dear Natalie,

We certainly had an adventure! All the students enjoyed showing off their car for you, talking to the "big guys" and seeing the construction of the U. of Ottawa's entry in the open class.

While driving home Saturday night we talked about the race and our car and we all agreed this had been a worthwhile adventure. The kids said they would be starting to fund raise soon for a new, revised version of their car, to race or show next year in Ottawa or the western provinces. This weekend is exactly what students at a high school level need in order to see the relevance or application of new technologies.

As requested, I've tried to keep expenses to a minimum by not submitting receipts for meals of Saturday noon or night or one of the hotel rooms we used.

Please keep me informed on what you are doing next, and of course if you come across any information on design or construction of a solar car pass it along.

Thanks again--it was fun.

Regards,

Pete Levan

Encl.

Promotion/Publicity

University GCSR events were promoted through direct mailings to professors at 80 post-secondary institutions and through advertisements in Engineering Student Association newsletters.

High school events were promoted through a direct mailing to science and geography teachers within 3-5 hours driving distance from Toronto; through advertisements in four teacher magazines; and through flyers and articles in Crucible (Science Teachers Association newsletter), Current (Ontario Hydro's magazine for teachers), Energy Alert (Energy Educators of Ontario magazine), Interactions (Environmental Science Teachers Association newsletter) and the Canadian Energy Education Newsletter.

A follow-up mailing was sent to schools in and around Metro Toronto. Additionally, SESCI rented a booth at the annual Ontario Energy Educators conference to promote the GCSR.

Press releases and public service announcements were sent out prior to the GCSR.

An article was written for SOL and a display booth was set up at Sustainable Energy Choices for the 90's in Halifax.

(see following 9 pages for a selection of articles and announcements)

Racing For The Sun

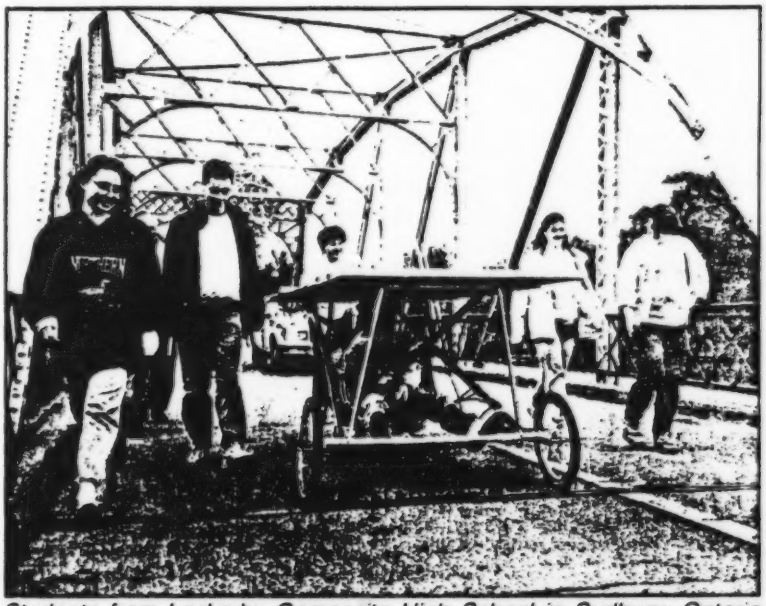
by Alex Waters

What has four legs, is green, and loves solar energy? Of course it's Iggy the Iguana! For those unfamiliar with Iggy, he is a pet iguana from King City Secondary School in Ontario whose terrestrial environment is regulated by an 18 watt photovoltaic (PV) module. Iggy's home was one of many creative projects entered into this year's Great Canadian Solar Race (GCSR) at the Kortright Centre for Conservation.

For the past six years, the Solar Energy Society of Canada has sponsored the Great Canadian Solar Race to increase public awareness of renewable energy sources.

This year's race consisted of The University Thermosyphon Event and two high school competitions: The Solar Hot Dog Race and The Photovoltaic Design Challenge. The day's events attracted 100 participants from various schools around Ontario and more than 300 curious and perplexed onlookers.

Ontario Hydro made their debut as a sponsor of the 1990 race, donating forty 40W PV panels for the PV Challenge Event.



Students from Lockerby Composite High School in Sudbury, Ontario proudly demonstrate their 200 watt photovoltaic powered car during the Canadian Solar Car Challenge event held in Ottawa. This automobile is the first of its type ever designed by Canadian high school students. They drove it around Ottawa City Hall on both battery and solar power, intriguing onlookers everywhere. Unfortunately, the two-day university-level race had to be cancelled due to mechanical difficulties and an accident involving the University of Waterloo's solar vehicle.

The first place winners in the photovoltaic design competition. This homeostatic regulated iguana farm controls ideal living conditions for its reptilian inhabitants. This principle is also equally applicable to buildings for human residency.

The day started off rather dismally as the predicted sunshine turned out to be rain. However, by 11:00 am the sun began to shine and the competition commenced. As it was an all day event, The University Thermosyphon Event started promptly.

After drawing water off several times during the day, the uncontested winner was Eugene Ryzer, a third year student from the University of Windsor. Eugene managed to make his water tank reach a temperature of 77 degrees Celcius, allowing him to claim the $600 prize.

Weiner Warriors

The Solar Hot Dog Race provided the most competitive challenge of the day. The hot and hazy weather made it difficult for any one solar cooker to walk away with the race. However, a frazzled judge, Steve Thwaites, finally managed to compute the tallies and come up with a winner. Only a few points separated each of the groups. First place went to Lisa Parsons and

Chris Haugh from South Huron H.S., Second place to Richard and Robert Krog from Oakville Trafalgar H.S. and Third place to Wilson Fong, Brad Lunch and Mike Ray, also from Oakville Trafalgar.

Special mention goes to St. Mary's from Mississauga who placed sixth. Although their solar box was over-sized, it was an excellent effort for a grade three group competing against the high school entrants.

Variety of Designs

The event that attracted the greatest number of curious onlookers was The Photovoltaic Design Challenge. This was an inventor's dream and a patent clerk's nightmare. Designs included solar shades, drink coolers, burglar alarms and sailing boat exhaust fans. After several hours of scratching their heads, the judges declared Iggy and his homeostatic regulated home, designed and built by Kipp Cannon, Peter Saulesleja and Robert Shmayda from King City, the winner. A close second place entry came from Andrew Khoo, Jano Nikhilanandhan and Lewis Zalany from Oakville Trafalgar High School who built a Light Emitting Diode system. Judge Don Adkinson was amazed with the ingenuity of the entrants.

Third place went to Chris Eccles and Geoff Stang from South Huron District High School in Exeter, Ontario for their design of an electrostatic precipitator for removing particles from car exhausts. Talk about solar energy being truly environmentally friendly!

According to Race Coordinator Natalie Gallimore, the quality of the projects was "the best to date. The 200 watt high school car was as good as university designed cars from 1988 and the 1990 university built road-racers are competitive on an international level thanks to design fundamentals learned in early GCSR events."

Overall, the judges and onlookers were very impressed by the creativity and hard work that went into all of the projects. Congratulations to all of the participants.

The Solar Energy Society of Canada is hoping to expand the race to other provinces and organizers and judges look forward to new innovative designs. Keep watching future issues of SOL for details of the 1991 GSCR.

Solar Vehicles

Sun Quest: Shaping Up For The Future

The Queen's University Engineering Solar Team is on a promotional tour of Canada this summer. Showcasing their solar car, Sun Quest, they hope to raise enough money for their entry into the Australia World Solar Challenge Competition which will begin in November.

Constructed by a team of thirty engineering students advised by Steve Harrison, Sun Quest is a second generation solar powered racing car which evolved from Queen's first solar vehicle, Photomoto.

The vehicle is a single occupant racer powered by solar energy and battery reserve only and can reach speeds of up to 50 km/hr.

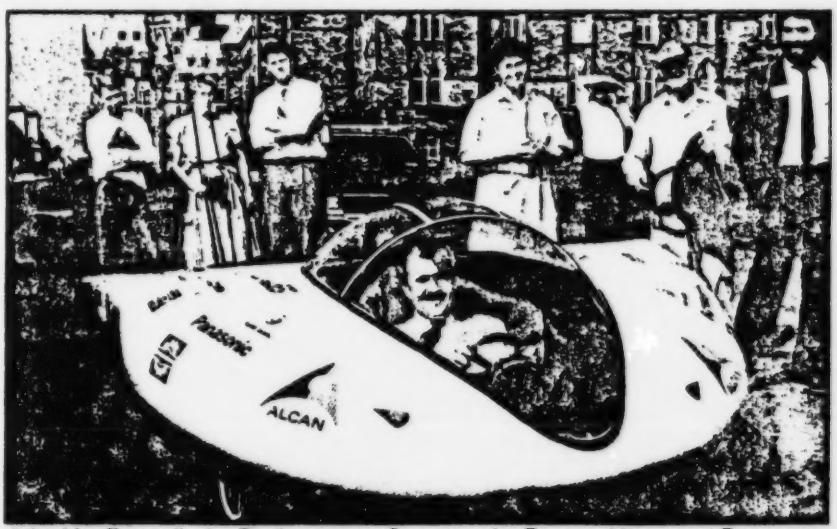
The goals of the design team extend beyond those required to design and build a competitive solar vehicle. They seek to further awareness of environmental issues and wish to advocate electric vehicles as a future transportation alternative.

"We're promoting solar energy by bringing this car across Canada to 38 schools. It's generating a lot of excitement," says Harrison.

The Sun Quest promotional tour began on May 14 and winds up on August 25. The Queen's Solar Team will travel from Montreal to Edmonton, demonstrating their vehicle to elementary and high schools as well as appearing at events such as the Calgary Stampede, The Saskatchewan Air Show, The Toronto Molson Indy, and the Canadian National Exhibition in Toronto.

Energy, Mines and Resources Canada granted the Queen's Solar Team $5,000 towards the design and development of Sun Quest. The Ministry of Science and Technology has contributed $38,000 to the team for its cross-Canada promotional tour. The total budget for the Sun Quest project is more than $400,000, of which over half has already been raised by the team. "We've received terrific support from industry. They're bending over backwards for us," remarks Harrison.

The vehicle gives hope for the future, but also presents us with alternatives for today. Louise Taylor, a member of the design team comments, "Solar cars won't be available for 30-40 years, but if you remove the solar panels from the car, you are still left with an electrically powered vehicle that is a viable transportation alternative for today."



John MacDougall, the Parliamentary Secretary for Energy, Mines and Resources takes the Queen's University solar powered car Sun Quest out for a test drive on Parliament Hill during one of the car's many promotional stops.

Solar Challenges

Alex Waters

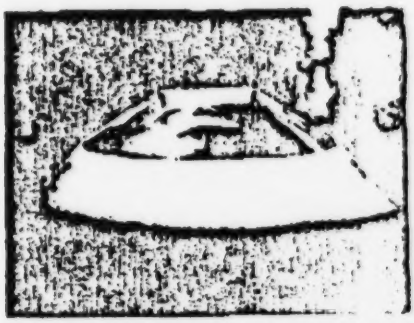
Kortright Centre, 5 Shoreham Drive
Downsview, ON M3N 1S4

Challenges! That's what makes the world of science and technology tick. A challenge motivates and focuses people's attention. When there's a challenge, scientists, governments and industry focus all their resources (skills, technology, money and people power) to rise to the occasion and solve the particular problem that instigated the challenge.

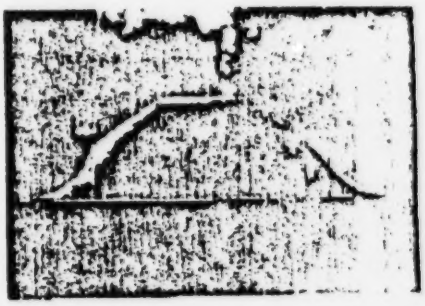
One such example of what can be accomplished when a challenge is issued, and all the resources of a group are focused, is the General Motors (GM) "Sunraycer."

The GM Sunraycer is the world's fastest Solar electric vehicle, and winner of the 1987 World Solar Challenge. The World Solar Challenge was a grueling 3,138 km race across the outback of Australia, using a vehicle powered solely by the sun's energy. The race provided the motivation for industry and universities to research, design and demonstrate the potential of solar electric technology. The result was a 24 car race with some of the strangest looking vehicles from all over the world.

In less than one year General Motors designed and built a solar electric car that could travel an average of 67 km/hr. and sprint up to 113 km/hr. The car combined hi-tech solar cells and batteries, light weight construction and aerodynamic design to finish the race in five days, 2 1/4 days ahead of the second place car.



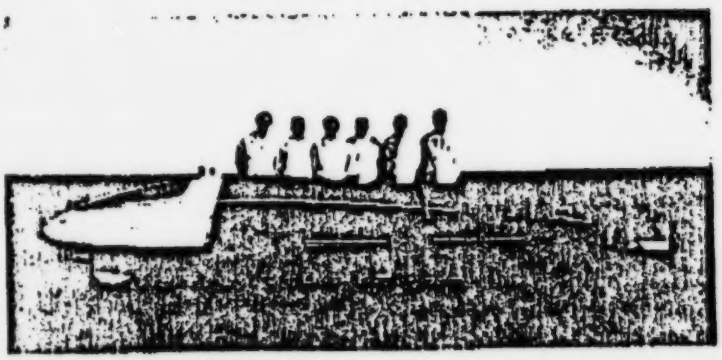
If teachers are looking for a challenge to stimulate, motivate and focus their students' energies for the 1989-90 school year, now is the time and here is the **CHALLENGE**.



The winner, going away

The Solar Energy Society of Canada, in conjunction with the Kortright Centre for Conservation, is inviting secondary students to enter the Great Canadian Solar Race on June 2, 1990. The race includes two design challenges; the Hot Dog Cooking Contest, and a Solar Electric (Photovoltaic) Design Challenge. Prizes will be awarded for the top three competitors in each field.

For more information contact Alex Waters, Kortright Centre, 5 Shoreham Drive, Downsview, ON M3N 1S4, telephone: (416) 832-2289.



Winning team.

SESCI

Solar Energy Society of Canada Inc.
Société d'Énergie Solaire du Canada Inc.

3-15 York, Ottawa, Ontario K1N 5S7 (613) 236-4594

The Voice of Conservation and Renewable Energy in Canada
Pour promouvoir l'usage optimal des énergies renouvelables

OTTAWA-- It's more interesting than the Indy 500! The Fourth Annual Canadian Solar Car Challenge will take place through the streets of the Ottawa region on the Victoria Day Weekend.

Sponsored by the Solar Energy Society of Canada Inc., the race will provide a great opportunity for the public to see aerodynamic, solar-powered cars. RALOS, the car of the University of Ottawa, will compete against Midnight Sun from the University of Waterloo in the two-day event.

These road-worthy electrical vehicles can zoom at speeds up to 80 km/h.

The teams will demonstrate their cars at City Hall on Saturday, May 19 from 10 a.m. until 10:45 a.m. Lockerby Composite high school from Sudbury will also show off the first full-size solar car built by high school students.

At 10:45 RALOS and Midnight Sun will leave City Hall, driving westbound on Sussex to Wellington, past Parliament Hill to the Western Parkway and on to Andy Haydon Park.

This is another chance to see the cars up close, as the teams prepare at the park for the official start.

The first day of the 230-km race will take the cars to Dunrobin, near Constance Bay, Fitzroy Harbour, Carp, through Kanata, ending at Bell's Corners. On Sunday May 20, the second leg will see the cars drive through Kemptville and Winchester.

At approximately 4 p.m. Sunday, the race will end at the Sears Clearance Centre parking lot on Walkley Rd. in south Gloucester.

For RALOS and Midnight Sun, the Canadian Solar Car Challenge is just the start to a year of solar car races. Both cars, unveiled only this week, are scheduled to compete in the Florida to Detroit Sunrayce sponsored by GM in July. The top three teams at that race will compete in the World Solar Challenge across Australia next November.

Everybody is encouraged to come out and cheer on their favorite car!

-30-

FOR IMMEDIATE RELEASE MONDAY MAY 28, 1990:

SUGGESTED TEXT (30 SECONDS) OF PUBLIC SERVICE ANNOUNCEMENT TO INFORM THE PUBLIC ABOUT **THE GREAT CANADIAN SOLAR RACE.**

The Solar Energy Society is hosting the Great Canadian Solar Race at the Kortright Centre, Saturday, June 2nd at 10:30am.

Events include a Solar Hot Dog Cook-off, Photovoltaic Design Challenge and the Thermosyphon Water Heating Race.

This caps off Environment Week and remember, Earth Day is everyday, and it begins with YOU!

- 30 -

* Note: Rain date will be June 3rd, 10:30 am.

For further information:
Alex Waters, Kortright Centre (416) 832-2289
Natalie Gallimore, Solar Energy Society of Canada (613) 236-4594.

FOR IMMEDIATE RELEASE TUESDAY MAY 28, 1990:

Spring into summer with a bang!

Toronto -- The Solar Energy Society of Canada Inc. (SESCI) is proud to present the sixth annual Great Canadian Solar Race to be held at the Kortright Centre for Conservation on Saturday, June 2nd, commencing at 10:30 am.

A host of exciting events are planned including the Photovoltaic Design Challenge in which photovoltaic-powered devices designed by Ontario High School students will be tested and judged. One of the more interesting design submissions is a Homeostatic Iguana Farm.

Connoisseur conservationists will take particular interest in the Solar Hot Dog Cooking Contest in which teams of four high school students design and utilizize a solar powered hot dog cooker. The cookers will be judged on speed, ingenuity and the quality of the warmed-up weiners.

Also of intrigue will be the Thermosyphon Water Heating Race in which students from Algonquin College (Ottawa), Royal Military College (Kingston) and the University of Windsor have designed flat plate solar energy collectors. Hot water will be drawn throughout the day and the winner will be determined on the basis of originality in design, water temperature, and cost-efficiency.

This is a fantastic oppurtunity for the public to increase their renewable energy and energy conservation awareness as well as a fun time for all!

Although the Great Canadian Solar Race is the grand finale of Environment Week, don't let it end there. Remember, Earth Day is everyday, and it all begins with YOU!

The Great Canadian Solar Race is co-sponsored by Energy, Mines and Resources Canada, Ontario Hydro, Ontario Ministry of Energy and the Metropolitan Toronto Regional Conservation Authority.

- 30 -

* Note: Rain date will be June 3rd, 10:30 am.

For further information:
Alex Waters, Kortright Centre (416) 832-2289
Natalie Gallimore, Solar Energy Society of Canada (613) 236-4594.

SESCI

Solar Energy Society of Canada Inc.
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3 - 15 York, Ottawa, Ontario K1N 5S7 (613) 236-4594

The Voice of Conservation and Renewable Energy in Canada
Pour promouvoir l'usage optimal des énergies renouvelables

Attention Engineering Students Association

Announcing for 1990
The 6th Annual Great Canadian Solar Race

Last year the University of Windsor and Queen's provided the winning teams for the two University competitions at the 5th Great Canadian Solar Race. They are looking for a repeat performance in 1990.

The photovoltaic (PV) car race and the thermosyphon water heating event offer students: the chance to work with renewable energy technologies, a paid trip to the metropolis of Toronto, cash prizes for winners, and a chance to beat other schools!

The enclosed photocopy from SOL magazine highlights last year's event. The rules for the thermosyphon water heating event are also enclosed. The PV car race rules are undergoing amendment but if you're interested, send your name in and as soon as they become available we'll mail the rules to you.

The number of competing teams receiving travel support for each event is limited to seven, so hurry and send applications quickly as they will be processed on a first come basis.

For further information contact:

Solar Energy Society of Canada Inc.
3 - 15 York Street
Ottawa, Ontario
K1N 5S7
(613) 236-4594

Also attached are three race announcements in different sizes. If you have any additional room in your newsletter perhaps you could insert one of these announcements.

Plan On Entering Now!
The Great Canadian Solar Race
June 1990

For Universities and College Students Canada-Wide

PHOTOVOLTAIC CAR RACE

- Last year Queen's took away Waterloo's title and speed record in this race which demands the designing, building and racing of full-size photovoltaic (PV) cars powered entirely by solar energy.

THERMOSYPHON DESIGN COMPETITION

- Teams must design, build and compete with solar water heaters which work on the thermosyphon principal.

Get involved in designing equipment that will propel Canada in a cleaner energy direction.

OVER $ 2,000 IN CASH PRIZES FOR WINNERS

SESCI

For Further Information Contact:
Solar Energy Energy Society of Canada
Suite 3, 15 York Street
Ottawa, Ontario K1N 5S7
(613) 236-4594

SESCI

Plan On Entering Now!
The Great Canadian Solar Race
June 1990

For Universities and College Students Canada-Wide

Photovoltaic Car Race

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Thermosyphon Design Competition

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CASH PRIZES FOR WINNERS !!

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SESCI

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GREAT CANADIAN SOLAR RACE
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Teams must design, build and compete with solar water heaters which work on the thermosyphon principal.

CASH PRIZES FOR WINNERS !!

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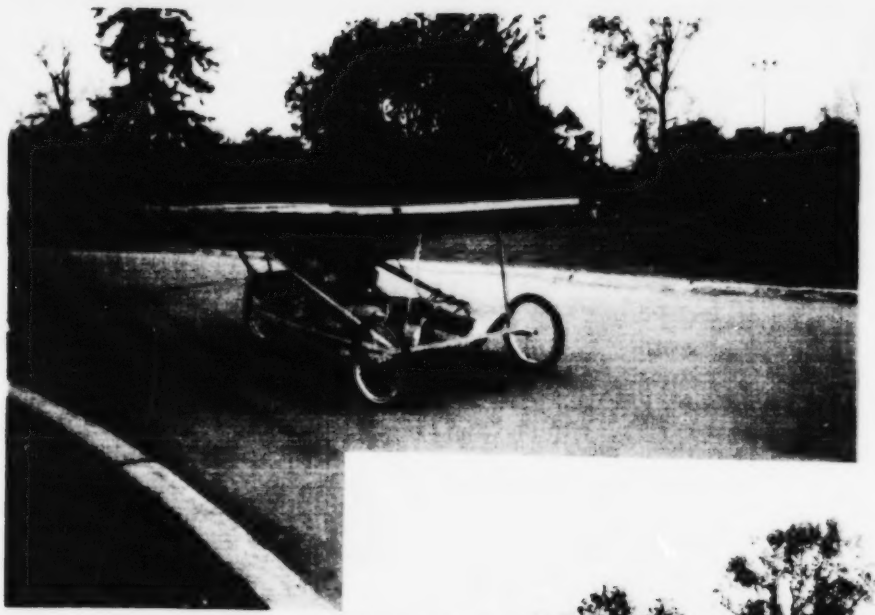
PV Car Race

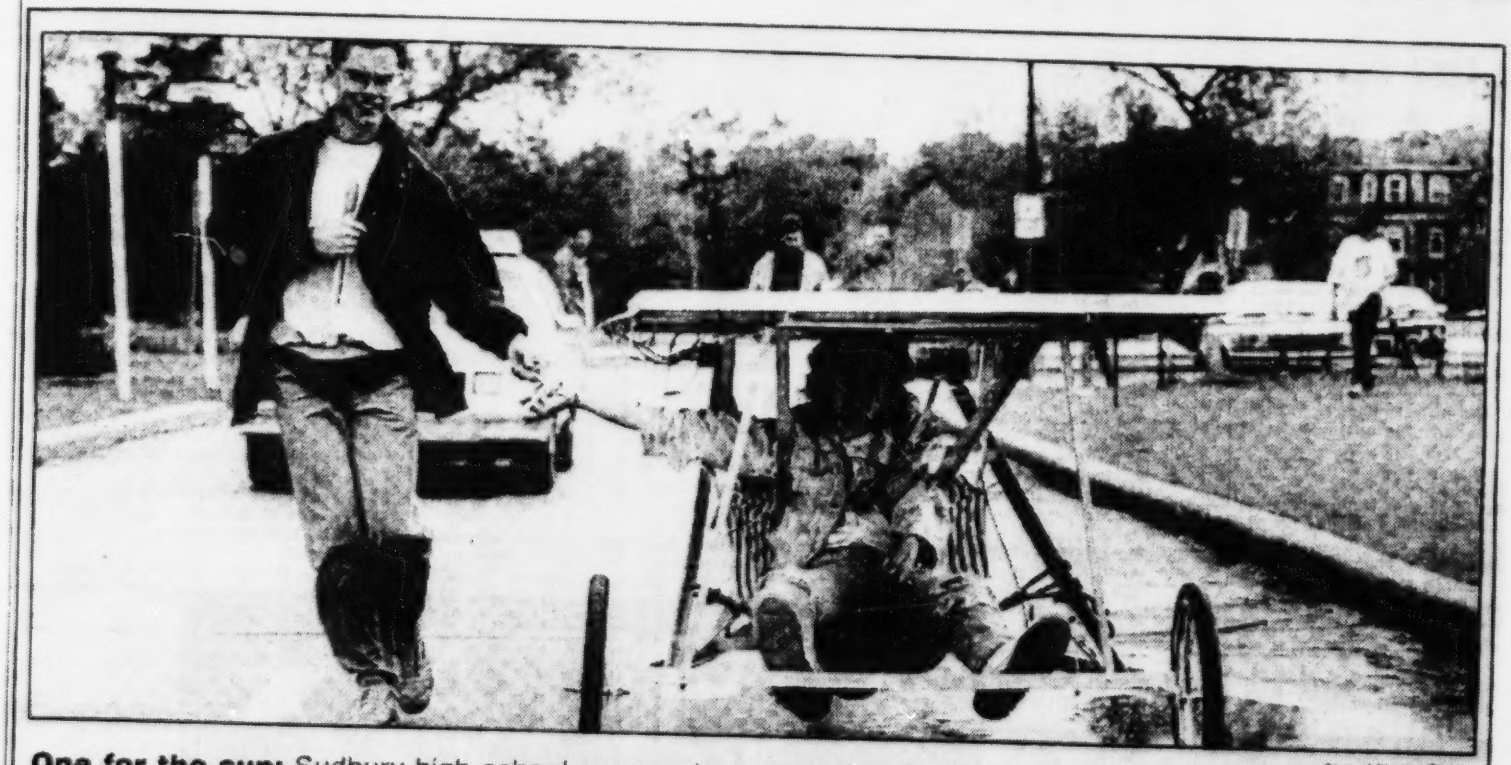
Two classes of cars were accomodated for the race. Class A solar powered cars with batteries to provide up to 5 kW/hr of energy and Class B solar powered cars with a 2000 watt maximum.

Unfortunately, the two day road race for Class A cars had to be cancelled. The University of Ottawa team pulled out of the race two days prior because their vehicle was not ready. The University of Waterloo team was involved in a car accident on the way to Ottawa. Their solar vehicle suffered substantial damage.

The Class B high school team did however, demonstrate their car; and despite the above problems the event still received media coverage (see next two pages).

The University of Waterloo team set up a solar car display at the Kortright Centre during the other GCSR events.





One for the sun: Sudbury high school car was brought for display, and wasn't entered in race

—Chris Mikula, Citizen

Lights out: Problems end solar car race

By Vanessa Lu
Citizen staff writer

It wasn't cloudy skies that cancelled the solar car race.

Solar cars can still run even if the sun isn't shining because the energy produced from the limited light can be combined with a backup battery.

But University of Ottawa students could not complete their entry in time for the fourth annual Canadian Solar Car Challenge, a two-day, 230-kilometre race which was to wind its way through the national capital region and end in south Gloucester.

And the only other competitor, a $116,000 vehicle from the University of Waterloo, was damaged en route to Ottawa when the trailer it was in left the road and struck a tree.

Student Jordan Smith said the battery compartment and six out of 55 solar panels were damaged. Repair costs are estimated at $6,000 to $7,000.

"At least it's salvageable," said Smith. "But it won't look as good as before."

With no cars on hand for the race, students from Lockerby Composite school in Sudbury showed off the first solar car made by high school students. Physics teacher Pete Levan said about 20 students from grades 11 to 13 worked on the $3,000 project since February. Their car was not participating in the race.

Both university cars are to compete in a GM-sponsored race in July from Orlando, Florida, to Detroit.

Photovoltaic Design Challenge

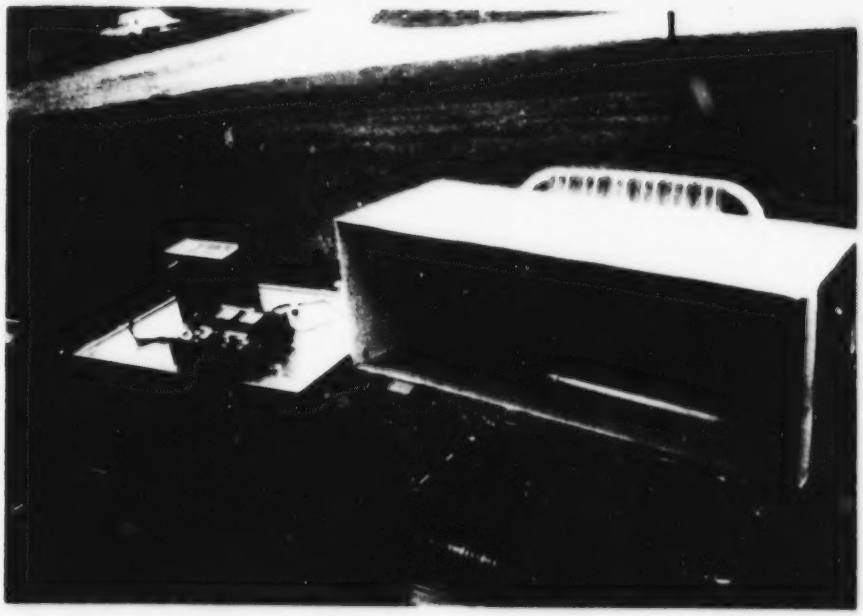
A new event offered in 1990, the photovoltaic design challenge is aimed at high school students. Teams were asked to design a pv-powered device. (Forty 18 watt PV panels were donated by Ontario Hydro) All competitors were allowed to keep their panels.

SESCI judges Steve Thwaites, Rob McMonagle, Don Adkinson and Per Drewes were amazed by the students' creativity. There were 22 entries in all. Designs included solar shades, drink coolers, burglar alarms and sailing boat fans. This event proved to be the most popular with the public and with the students.

First place was awarded to King City High School for its homeostatic regulated iguana farm. Second place was awarded to students from Oakville Trafalgar High School for its light emitting diode system. South Huron High School placed third with its electrostatic precipitator for removing particles from car exhausts.

SESCI judges evaluate the winning project a homeostatic regulated iguana farm, entered by students from King City High School.

IGGY THE IGUANA BUSY ENJOYING HIS PHOTOVOLTAIC CONTROLLED LIVING CONDITIONS. PLEASE NOTE IGGY'S LOOK OF TOTAL BEWILDERMENT AND CONFUSION. IT AIN'T EASY BEING GREEN.



SECOND PLACE PHOTOVOLTAIC DESIGN CHALLENGE WINNER: PHOTOVOLTAIC POWERED CHRISTMAS LIGHTS FROM OAKVILLE TRAFALGAR HIGH SCHOOL.

JUDGING THE THIRD PLACE WINNER, AN ELECTROSTATIC PRECIPITATOR TO IMPROVE INDOOR AIR QUALITY.

Finalists in the PV Design Challenge
(top left) PV powered ventilation system
(lower left) PV powered morning wake up system
(above) PV powered burglar alarm

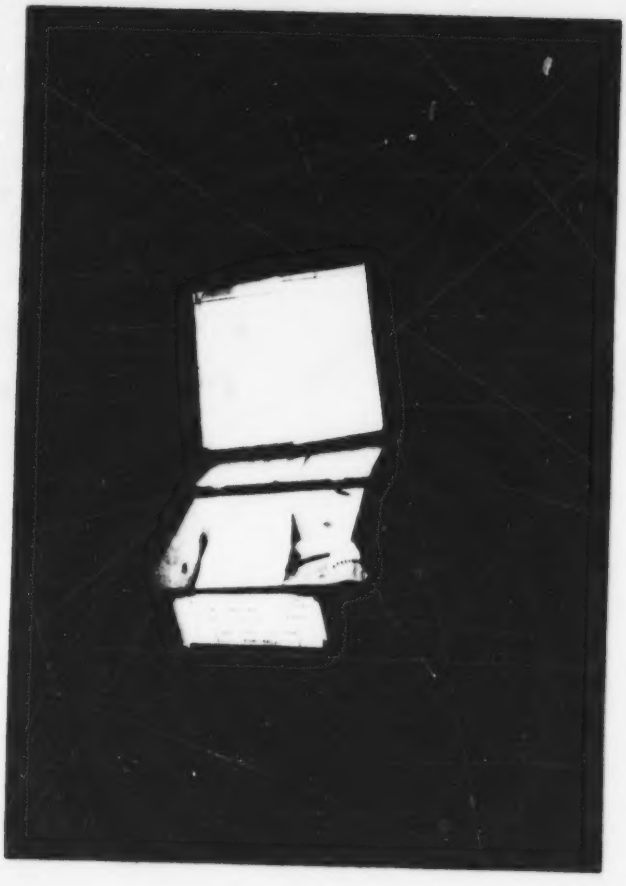
Photovoltaic Hot Dog Cooking Contest

High school teams design a parabolic hot dog cooker less than $1m^3$ to broil a hot dog on a skewer. Besides heating performance, the designs were judged for the design features such as temperature indicators, aiming, durability and portability.

Twenty-one teams (consisting of up to four students) entered this event, representing a 150 per cent increase from 1989. Of particular note is that a grade three team entered the event and gave the high school teams a run for their money.

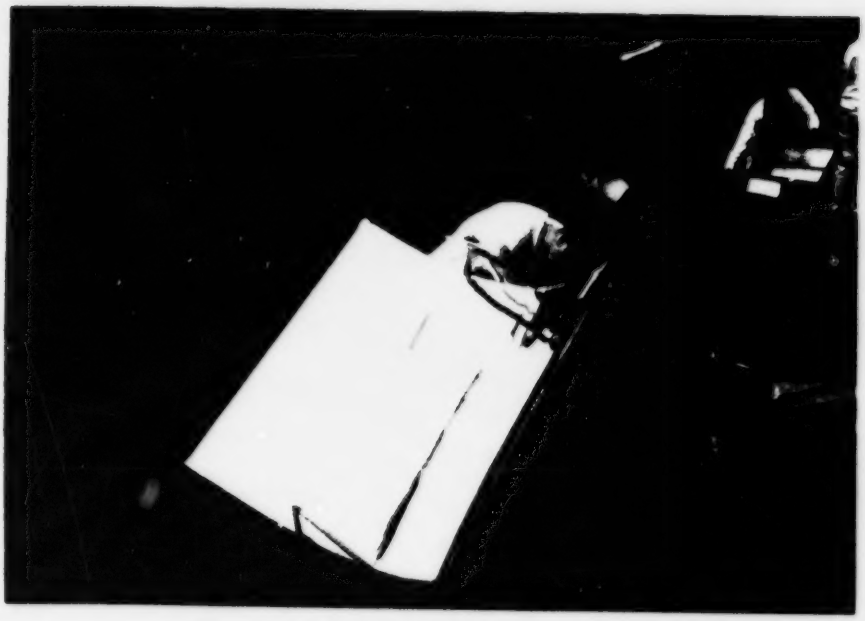
The race was very close. Only a few points separated the winners. South Huron High School placed first; while Oakville Trafalgar teams placed both second and third.

Judge Steve Thwaites gives last minute race insturctions to PV hot dog cooking teams (left). Below he fires the starting gun.

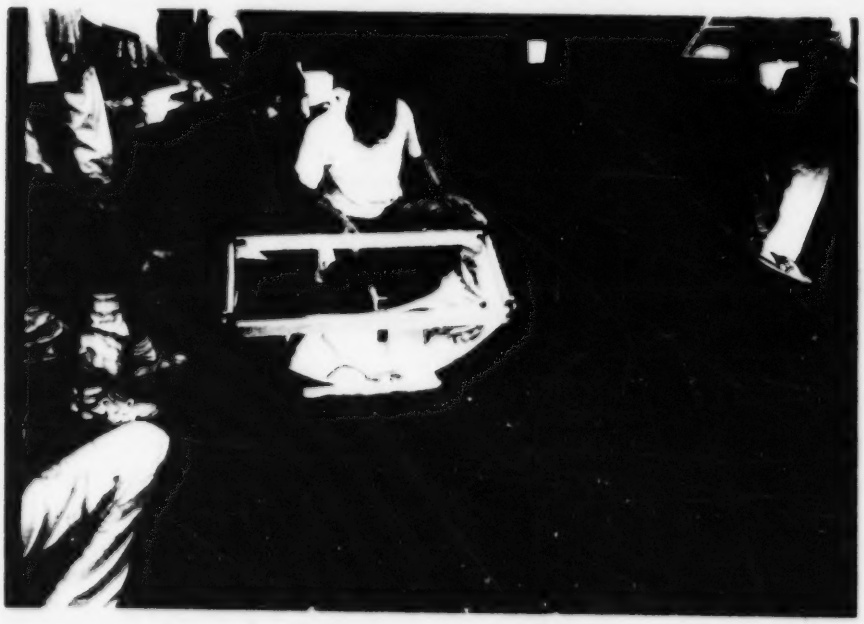


THE WINNING DESIGN IN THE SOLAR HOT DOG COOKING CONTEST.

THIS DISPLAY WAS MADE BY GRADE 3 STUDENTS FROM SAINT MARY'S CATHOLIC SCHOOL. THESE WERE THE YOUNGEST ENTRANTS EVER.



Both the second and third place winners in the Solar Hot Dog Cooking Contest were from Oakville Tralfagar High School.



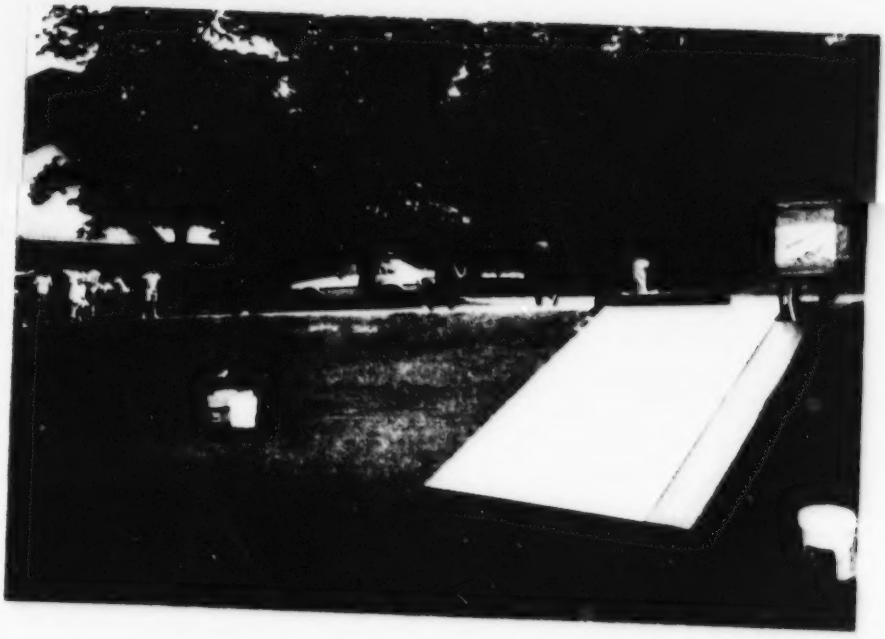
Thermosyphon Event

The Thermosyphon Event challenges college and university teams to design and construct a $3m^3$ solar domestic hot water system. (Fourth year students are encouraged to take this on as their final fourth year project.) The unit is reassembled on-site on the day of competition. Cold water is placed simultaneously in all entries. Periodic water draws determine the design with the best thermal conversion performance.

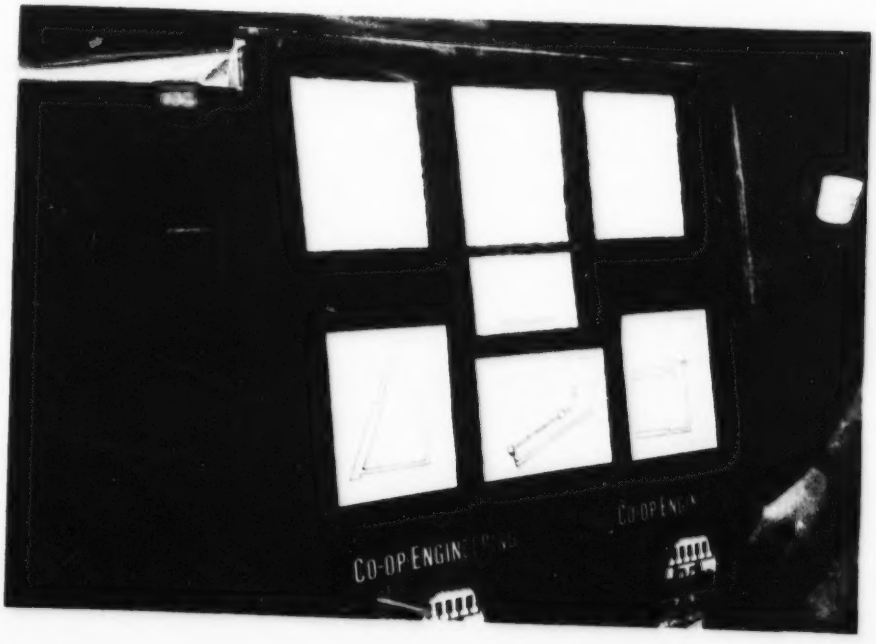
Three teams (University of Windsor, Algonquin College and Royal Military College (RMC)) entered the 1990 Thermosyphon Event. It is worth noting that both Algonquin College and RMC are first time participants in the Great Canadian Solar Race.

Unfortunately, the prolonged teacher's strike at Algonquin College necessitated the team's withdrawal from the thermosyphon event. And, a last minute setback resulted in RMC pulling out of the event, which was held at the Kortright Centre. However, professors from both colleges have indicated their interest in participating in next year's race.

The winning entry, by University of Windsor third-year student Eugene Ryzer managed to reach a temperature of 77 degrees Celsius. Spectators enjoyed his display at the Kortright Centre.



UNIVERSITY OF WINDSOR'S THERMOSYPHON ACHIEVED 90 DEGREE(CELCIUS) TEMPERATURES DESPITE THE OVERCAST CONDITIONS.



Recommendations For a 1991 GCSR Program

1) Open the high school events to primary grade schools or at the minimum junior high students to attract even more participants. The grade three team from St. Mary's displayed great creativity and demonstrated that junior students are capable of competing in GCSR events. We would suggest making it a class project (as oppposed to teams of up to four students) since the teacher must still provide a great deal of guidance.

2) Expand the GCSR westward. We recommend that events geared to junior students be organized in either Winnipeg, Calgary or Edmonton by SESCI chapters. At the same time, funding would be diversified since provincial ministries of energy and utilities could be approached. We envision that the GCSR would eventually consist of regional events with a national run-off.

3) Change the focus of the university-geared Thermosyphon Event. For the past six years the Thermosyphon event has focused on heating. We feel that the advisors may be getting tired of this concept. Therefore, to encourage more entries we suggest the 1991 event should focus on cooling. Alternately, we could replace the Thermosyphon Event with a photovoltaic pumping event. We anticipate good media coverage since we plan to rig buckets of water over each team so that the losing team gets dunked. Dave Shipley from Watsun User Services is chairing the 1991 university event. He is in the process of polling the various university engineering departments to determine which event professors are most interested in.

4) **Replace the PV car road race with a track race.** This event continues to be the premier media draw, but SESCI can not compete with larger better funded races, such as the GMSunrayce. We believe our niche is to help nuture as many teams as possible to develop cars. We foresee two classes in the 1991 event: Class A for high school teams and first time university entries (such as Concordia, Simon Fraser and University of Quebec who are already working on cars); Class B for road-licenced vechicles developed by teams such as Queen's, Waterloo and Ottawa University. Holding the race at an existing racetrack (ie. Mosport) would be great publicity and then the cars could be displayed at Kortright. High schools appear interested but say the cost of the PV panels is a drawback. We suggest lending teams PV panels to overcome this problem.

5) Continue participating in the Energy Educators conference to increase awareness about the GCSR. Motivating teachers is key to the race's continued growth. Once the teachers are on-side, they tend to enter the race year after year. For example, Oakville Trafalgar has won the high school events three years in a row. This is largely due to the efforts of one dedicated teacher.

Final Budget Analysis

EXPENSES		BUDGETED	ACTUAL
Labour	Manager	$700	$1500
	Assistant	2100	2800
	Part-time	100	500
Communications		1400	1400
Travel Assistance		3000	3000
PV Panels		1400	1400
Promotion Energy Educators		350	350
Halifax Display		450	450
Press Releases		800	800
Computer Network		400	400
Signage		200	200
Hats		900	786
Photos		200	200
Stationary		80	80
Photocopies		700	700
Prizes	Solar Car Event	1600	0
	Thermosyphon Event	900	600
	High School Events	900	1000
SESCI Memberships		480	480
Plaques		0	216
Lunch and Snacks		1000	433
Judges Honorarium		1000	1000
Trip to Halifax for Winners		2680	0
Miscellaneous		200	206
Meeting With ASES		0	806
TOTAL EXPENSES		**21540**	**19307**

REVENUE		
Ontario Hydro PV Panels	1400	1400
SESCI	3680	3680
Ontario Ministry of Energy	5 500	5500
Energy, Mines and Resources	8680	6805
Kortright Conservation Centre	2280	2280
TOTAL REVENUE	**$21540**	**$19685**